

WHAT IS CLAIMED IS:

1. A confocal microscope comprising:

a lighting means for illuminating a specimen with a beam of light;

5 an extraction means having sites for transmitting the beam of light emitted from said lighting means and sites for blocking light and adapted to extract a composite image obtained by overlaying a non-confocal image on a confocal image and a conventional image from the beam of light coming from said specimen;

10 an image pickup means for selectively picking up the composite image and the conventional image extracted by said extraction means; and

15 a control means for obtaining a confocal image of said specimen from the composite image and the conventional image picked up by said image pickup means, wherein

20 said extraction means has semi-transmissive regions showing a light transmissivity of  $k$  and an aperture region freely transmitting light irradiated from said lighting means, said semi-transmissive regions and said aperture region being adapted to selective use, and the area of said aperture region is equal to that of any of said semi-transmissive regions multiplied by  $k^2$ .

2. A confocal microscope comprising:

a lighting means for illuminating a specimen with

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a beam of light;

an extraction means having sites for transmitting the beam of light emitted from said lighting means and sites for blocking light and adapted to extract a composite image obtained by overlaying a non-confocal image on a confocal image and a conventional image from the beam of light coming from said specimen;

an image pickup means for selectively picking up the composite image and the conventional image extracted by said extraction means; and

a control means for obtaining a confocal image of said specimen from the composite image and the conventional image picked up by said image pickup means, wherein

said extraction means is formed by a disk rotatable around a rotary shaft located at the center thereof and said semi-transmissive regions contain a plurality of linear slits allowing light to pass therethrough, said semi-transmissive regions of said disk having a contour of a sector with a central angle not smaller than  $90^\circ$ , the top of the sector being located at the rotary shaft.

3. A confocal microscope comprising:

a lighting means for illuminating a specimen with a beam of light;

an extraction means having sites for transmitting the beam of light emitted from said lighting means and

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sites for blocking light and adapted to extract a composite image obtained by overlaying a non-confocal image on a confocal image and a conventional image from the beam of light coming from said specimen;

5        an image pickup means for selectively picking up the composite image and the conventional image extracted by said extraction means; and

10        a control means for obtaining a confocal image of said specimen from the composite image and the conventional image picked up by said image pickup means, wherein

15        said arithmetic operation means carries out a subtraction on the composite image data and the conventional image data obtained by said image pickup means by using a coefficient for realizing a desired ratio.

4. A confocal microscope according to claim 3, wherein

20        said control means further includes a ratio varying means for modifying said ratio.

5. A confocal microscope according to claim 3, further comprising

25        a brightness varying means for modifying the brightness of at least either said composite image or said conventional image.

6. A confocal microscope according to claim 5, wherein

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said ratio varying means is formed by a plurality of light blocking members for blocking light trying to pass therethrough.

5 7. A confocal microscope according to claim 6, wherein

said ratio varying means can use an angle between 60° and 90° for its ratio varying operation.

10 8. A confocal microscope comprising adapted to focus a beam of light by way of a mask pattern member variably operating with a predetermined pattern and an objective lens and cause the beam of light reflected by the specimen to enter an image pickup means by way of said objective lens and said mask pattern member to produce an image of said specimen for observation, said  
15 microscope comprising:

a drive means for driving said image pickup means for an image pickup operation in synchronism with the variable operation of said mask pattern member and modifying the relative distance between said objective  
20 lens and said specimen along the optical axis of the objective lens.

9. A confocal microscope according to claim 8, wherein

25 said mask pattern member is formed by a disk rotatably around a rotary shaft; and

said drive means includes a revolution detection means for detecting the rotary motion of said disk,

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an input pickup trigger means for outputting a trigger signal to said image pickup means in synchronism with the rotary motion of said disk as detected by said revolution detection means and a distance trigger means for modifying the relative distance between said objective lens and said specimen along the optical axis in synchronism with the rotation motion of said disk as detected by said revolution detection means.

10. A confocal microscope according to claim 8, wherein

said drive means includes a Z-stage for carrying said specimen thereon and modifying the relative distance between said objective lens and said specimen along the optical axis.

11. A confocal microscope according to claim 8, wherein

said drive means includes an objective lens drive means for driving said objective lens along the optical axis of said objective lens and said specimen.

12. A confocal microscope according to claim 8, wherein

said mask pattern member is formed by a disk rotatable around a rotary shaft; and

said drive means includes a rotary motion control means for controlling the rotary motion of said disk according to the NTSC or PAL signal from said image pickup means and a distance trigger means or modifying

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the distance between said objective lens and said specimen along the optical axis according to the NTSC or PAL signal from said image pickup means.

13. A confocal microscope comprising:

5 a lighting means for illuminating a specimen with a beam of light;

10 a plurality of objective lenses with different respective magnifications for focusing the beam of light coming from said lighting means and said specimen;

15 a rotary member having a plurality of pattern sections arranged respectively corresponding to said plurality of objective lenses for obtaining confocal image data of an image including those of the non-confocal component thereof and an aperture section for obtaining non-confocal image data containing only those of the non-confocal component;

a rotary drive means for driving said rotary member to rotate in a predetermined sense;

20 an image pickup means for picking up an image by means of the beam of light passing through each of said pattern sections and said aperture section of said rotary member driven to rotate by said rotary drive means;

25 an image processing means for storing the data of each image obtained by said image pickup means and obtaining a confocal image;

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a synchronizing signal generating means for generating a synchronizing signal in synchronism with the operation said image pickup means;

5 a detection means for detecting the state of rotation of said rotary member;

a control means for synchronizing the phase of the detection signal from said detection means and the signal from said synchronizing signal generating means; and

10 a trigger signal generating means for generating a signal to be used for controlling said image pickup means on the basis of the timing of said signal from said synchronizing signal generating means and said detection signal.

15 14. A confocal microscope according to claim 13, wherein

said rotary member is has said pattern sections and said aperture section arranged concentrically.

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